

Claims

I claim:

- 1 A method of presenting, on a computer controlled display device, transformation rules of abstract representations using animations to simulate continuous transformations.
- 2 A method of presenting transformation rules of abstract representations using animations to simulate continuous transformations where said presentation is for use in teaching said transformation rules.
- 3 The method of claim 1, said method comprising the steps of:
 - (a) calculating intermediate abstract representations between a starting and an ending representation;
 - (b) animating said transformation process by displaying sequentially on said display device, said intermediate representations, as is customary in the art of animation, making the transformation appear continuous.
- 4 The method of Claim 1 wherein an equation is said abstract representation.
- 5 The methods of Claim 1 wherein one or more of said animation means is selected from the group consisting of:
 - (a) means for moving of a symbol or symbols along a prescribed path;
 - (b) means for changing of said symbol or symbols to other symbol or symbols;
 - (c) means for splitting of said symbol or symbols into multiple copies;
 - (d) means for causing said symbol or symbols to fade out;
 - (e) means for causing said symbol or symbols to fade in;

(f) means for adding of pictorial additions to any of said symbol or symbols.

(g) means for removing of pictorial additions to any of said symbol or symbols.

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6 The methods of Claim 1 further comprising means for displaying an animated picture, and means for sequencing the animations of said picture with said animations of said representations.

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7 The methods of Claim 1 further comprising means for accepting user input and responding to user input.

8 The methods of Claim 7 further comprising means for changing said display in response to said user input.

9 The methods of Claim 8 further comprising computer controlled voice explanations of said animations, and means of synchronizing said voice with said animations.

10 The methods of Claim 9 additionally comprising:
(a) means for converting text to speech,
(b) method of using a text script to control the synchronization of the voice with the animations.

11 The methods of Claim 10 additionally comprising means for evaluating, in real time, the context dependent content in said voice explanations.

12 The methods of Claim 1 wherein said presentation is for use in the teaching of said transformation rules.

5 13 The methods of Claim 3 wherein said presentation is for use in the teaching of said transformation rules.

14 The methods of Claim 4 wherein said presentation is for use in the teaching of said transformation rules.

15 The methods of Claim 5 wherein said presentation is for use in the teaching of said transformation rules.

16 The methods of Claim 6 wherein said presentation is for use in the teaching of said transformation rules.

17 The methods of Claim 7 wherein said presentation is for use in the teaching of said transformation rules.

20 18 The methods of Claim 8 wherein said presentation is for use in the teaching of said transformation rules.

19 The methods of Claim 9 wherein said presentation is for use in the teaching of said transformation rules.

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20 The methods of Claim 10 wherein said presentation is for use in the teaching of said

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Figure 6. The effect of the initial concentration of the monomer on the polymerization of **1**. Polymerization conditions: [AIBN] = 0.008 mol/L; [M] = 0.001–0.01 mol/L; [H₂O] = 0.001 mol/L; [DMSO] = 0.009–0.0099 mol/L; T = 70 °C; t = 2 h.